## REMARKS

Claims 1, 3-4, 6-13, 19 and 22-29 are currently pending in the present application. No new matter has been added. Applicant respectfully requests reconsideration of the present application in view of the following remarks.

### *35 U.S.C. 103(a) rejections*

Claims 1, 4, 6, 11-12, 19 and 23-29 were rejected under 35 U.S.C. 103(a) as being unpatentable over Singh et al. (U.S. 2002/0027954 A1) in view Jun et al (U.S. 7,027,509). Claims 3, 13 and 22 were rejected under 35 U.S.C. 103(a) as being unpatentable over Singh in view of Jun and further in view of Murata of record. Claims 7-10 were rejected under 35 U.S.C. 103(a) as being unpatentable over Singh in view of Jun and Murata , and further in view of Youn et al of record (U.S. 6,650,707).

It is respectfully submitted that no reasonable combination of the art of record suggests the combination of limitations recited in claim 1.

As is known by those of skill in the art, and described on page 8 of the present application, the basic building block of an MPEG frame is a macroblock. The differences between the values of a macroblock in a predicted frame and an associated actual frame are further grouped into 8x8 blocks. A spatial transform (i.e., discrete cosine transform (DCT)) is applied to each 8x8 block of difference values. The spatial transform serves to decompose the 8x8 block into a weighted sum of spatial frequencies (DCT coefficients). By way of example, there are 64 spatial frequencies which may occur in an 8x8 block of data.

Element (a) of claim 1 specifically requires, "examining the coefficients of a plurality of DCT blocks corresponding to selected frames within a video shot to determine an **End of Block (EOB) length** for each of the examined DCT blocks." Nowhere does Singh teach or suggest determining an EOB length. It is acknowledged that Singh discloses the determination of other block statistics involving DCT coefficients such as "the quadrants that contain non-zero coefficients, the rows and columns that contain non-zero coefficents, and the dynamic range within the block (see paragraph [0006]). However, none of these statistics correspond to an EOB length. By way of example, the dynamic range refers to the difference between the maximum dequantized value and the minimum dequantized value of all of the 64 possible DCT coefficients. As described in paragraph [0090] of Singh, the values of the 64 possible DCT

coefficients may range from -2048 to +2047. Paragraphs [0091]-[0094] describe the computation of the dynamic range:

MAX (level)-MIN (level),

> "[0092] where level is the dequantized level value of each run/level pair;
>
> [0093] MAX ( ) compares each new level **value** against the previous largest value of the block and keeps the larger of the two;
>
> [0094] MIN ( ) compares each new level **value** against the previous smallest of the block and retains the smaller of the two."

Thus, the largest possible dynamic range according to Singh would be 2047 – -2048 = 4095. In contrast, as recited on pages 14-15 of the present specification, "The EOB marker value indicates that all further coefficients [of the 64 total coefficients] in the block have a value of zero." In other words, the EOB length (marker) corresponds to the highest DCT coefficient represented in the block (thus, the maximum possible EOB length would be 64). Furthermore, it should be noted that the EOB length is always relative to zero. By way of example, if the highest represented DCT coefficient is 39, then the EOB length is 39.

Element (b) of claim 1 specifically requires, "examining a distribution of EOB lengths associated with a **single selected frame**." Again, Singh does not disclose or suggest the determination of EOB lengths, let alone, examining a distribution of EOB lengths associated with a single selected **frame**. Rather, cited paragraphs [0043]-[0050] of Singh merely describe the computation of the distribution of coefficients within a sub-block defined by Singh. This makes sense since Singh discloses a "DCT block classification system" which "creates classes of blocks based on the location and frequency of sub-blocks containing non-zero DCT coefficients (paragraph [0029] of Singh)," each block containing four such 4x4 sub-blocks.

Element (c) of claim 1 specifically requires, "selecting a customized subset of iDCT algorithms for the **entire video shot** from a larger set of iDCT algorithms according to the distribution of EOB lengths for the **single selected frame**." This requirement is based on two observed properties of typical EOB probability distributions. These properties are: 1) "EOB address probability distributions may vary significantly for different video shots (pg. 17 lines7-8)"; and 2) "Within a shot and over spans of a few hundred frames EOB histograms often show little significant variance…Therefore, the optimal mix of iDCT routines remains fairly static within an individual shot (pg. 17 lines 21-23)." In view of these properties, a customized set of iDCT algorithms is selected for the entire video shot based on the distribution of EOB lengths for

a single selected frame. The customized subset is subsequently used for every block of the entire video shot to be transformed. Nowhere does Singh alone or in any combination with any or all of the art of record suggest such an approach.

In stark contrast, Singh discloses a much different method based upon the classification of sub-blocks. In one embodiment, Singh chooses a customized subset of alternative iDCT algorithms corresponding to those block classes which occur with the highest probability. More particularly, Singh's method results in only 8 possible classes, each class representing 1 of the 8 possible configurations of zero sub-blocks within the larger 8x8 block (paragraph [0031] and corresponding figure). Singh then describes the choosing of an iDCT algorithm customized for a single class of sub-blocks. Of particular relevance, it should be noted that rather than choosing a customized subset of iDCT algorithms on-the-fly for an entire video shot based upon an EOB distribution of a single frame, Singh chooses his customized subset <u>**empirically**</u> for the <u>**entire video sequence**</u> (as opposed to a single shot), and furthermore, Singh chooses his customized subset <u>**off-line**</u>. Paragraph [0052] of Singh recites, "The probability of occurrence for each of the classes can be estimated off-line by computing statistics using a large number of MPEG2 video source sequences. It should be appreciated that the on-the-fly customization of iDCT algorithms for a video shot of a video sequence described by the present invention as recited in claim 1 represents a significant improvement over Singh and the other art of record.

In view of the foregoing, it is respectfully submitted that Singh, alone or in any combination with any or all of the art of record, fails to teach or suggest the invention as recited in claim 1, and hence, the outstanding rejection of claim 1 should be withdrawn.

Claims 3, 7-8, 19, 23-25 and 29 each depend either directly or indirectly from independent claim 1 and are therefore respectfully submitted to be patentable over the art of record for at least the reasons set forth above with respect to claim 1. Furthermore, these dependent claims require additional elements that when considered in the context of the claimed invention further patentably distinguish the art of record.

All other independent claims (4, 6 and 11) recite essentially the same limitations as independent claim 1 and are also believed to be allowable as are their respective dependent claims.

## CONCLUSION

In view of the foregoing amendments it is respectfully submitted that the present application is now in condition for allowance. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
BEYER WEAVER LLP

/Michael J. Ferrazano/
Michael J. Ferrazano
Reg. No. 44,105

P.O. Box 70250
Oakland, CA 94612-0250
Telephone: (408) 255-8001